AMENDMENTS TO THE CLAIMS:

Without prejudice, this listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1 to 24. (Canceled).

25. (Currently Amended) A decoding method for demodulating a received signal available in serial code concatenation in a code-division multiple access transmission system, a two-step coding being carried out at the transmitting end of the transmission system, the method comprising:

providing a soft-in/soft-out decoder in a receiver of the transmission system, a first decoder step of the soft-in/soft-out decoder including an inner decoder and a Hadamard orthogonal multi-step inner code, a second decoder step of the soft-in/soft-out decoder including an outer_decoder and an outer error correcting code of a predefined rate; and

processing soft values as reliability information at an output and an input of the soft-in/soft-out decoder, a soft output of the inner decoder being a soft input for the outer decoder, a channel reliability information output from a preceding demodulation being an input for the inner decoder;

wherein one of the following is satisfied:

(1) a modified soft-decision Viterbi algorithm is used in which reconstruction is performed for coded bits of the outer code, and is not performed for transmitted information bits; and

(2) a maximum a posteriori decoder is used, in which soft information pertaining to calculations of the outer, coded bits is used partially as a priori information for systematic bits of the inner code, so that soft values are fed back to the first decoder;

wherein using logarithmic likelihood algebra, a maximum a posteriori (MAP) decoder for the inner code is expressed by the following first equation:

$$L^I(\hat{u}_k) = \ln \frac{\sum\limits_{x \in C^I, u_k = +1} P(x|y)}{\sum\limits_{x \in C^I, u_k = -1} P(x|y)} = \ln \frac{\sum\limits_{x \in C^I, u_k = +1} \exp(\frac{1}{2} \sum\limits_{i=0}^{N-1} L(x_i; y_i) \cdot x_i)}{\sum\limits_{x \in C^I, u_k = -1} \exp(\frac{1}{2} \sum\limits_{i=0}^{N-1} L(x_i; y_i) \cdot x_i)}$$

where the values satisfy the following second equation:

$$L(xi,yi) = \begin{cases} Le \bullet y_i + L^I(Ui); \ for \ i = \frac{1}{2^{k+1}} N; k = 0,\ldots,K-1 \\ Le \bullet y; \ otherwise \end{cases}$$

describe a probability of all elements of the resulting vector, x_i and y_i being Walsh functions, x and y being a vector, C being a code, U_i being a bit.

26. (Previously Presented) The method as recited in claim 25, wherein the probability is supplemented by an input vector y with probability L_c by a-priori information $L^I(u_i)$ for systematic bits according to the first equation of a code word, wherein the arguments of the exponential function in the second equation are results of correlating a resulting vector with all Walsh functions x_j, j= 0, ..., N-1, the correlation operation for all code words x_j being performed by applying a fast Hadamard transformation to provide a correlation vector w'.

Claim 27. (Cancelled).

28. (Currently Amended) A decoding device for demodulating a received signal available in serial code concatenation in a code-division multiple access transmission system, a two-step coding being carried out at the transmitting end of the transmission system, the device comprising:

a soft-in/soft-out decoder disposed in a receiver of the transmission system, a first decoder step of the soft-in/soft-out decoder including an inner decoder and a Hadamard orthogonal multi-step inner code, a second decoder step of the soft-in/soft-out decoder including an outer decoder and an outer error-correctinge code of a predefined rate, soft values being processed as reliability information at an output and an input of the soft-in/soft-out decoder, a soft output of the inner decoder being a soft input for the outer decoder, a channel reliability information output from a preceding demodulation being an input for the

inner decoder;

wherein one of the following is satisfied:

(1) a modified soft-decision Viterbi algorithm is used in which reconstruction is performed for coded bits of the outer code, and is not performed for transmitted information bits; and

(2) a maximum a posteriori decoder is used, in which soft information pertaining to calculations of the outer, coded bits is used partially as a priori information for systematic bits of the inner code, so that soft values are fed back to the first decoder,

wherein using logarithmic likelihood algebra, a maximum a posteriori (MAP) decoder for the inner code is expressed by the following first equation:

$$L^I(\hat{u}_k) = \ln \frac{\sum_{x \in C^I, u_k=+1} P(x|y)}{\sum_{x \in C^I, u_k=-1} P(x|y)} = \ln \frac{\sum_{x \in C^I, u_k=+1} \exp\left(\frac{1}{2}\sum_{i=0}^{N-1} L(x_i;y_i) \cdot x_i\right)}{\sum_{x \in C^I, u_k=-1} \exp\left(\frac{1}{2}\sum_{i=0}^{N-1} L(x_i;y_i) \cdot x_i\right)},$$

where the values satisfy the following second equation:

$$L(xi,yi) = \begin{cases} Le \bullet y_i + L^I(Ui);\ for\ i = \frac{1}{2^{k+1}} N; k = 0,\ldots,K-1 \\ Le \bullet y;\ otherwise \end{cases}$$

describe a probability of all elements of the resulting vector, x_i and y_i being Walsh functions, x and y being a vector, C being a code, U_i being a bit.

29. (Previously Presented) The device as recited in claim 28, wherein the probability is supplemented by an input vector y with probability L_c by a-priori information $L^I(u_i)$ for systematic bits according to the first equation of a code word, wherein the arguments of the exponential function in the second equation are results of correlating a resulting vector with all Walsh functions x_j, j= 0, ..., N-1, the correlation operation for all code words x_j being performed by applying a fast Hadamard transformation to provide a correlation vector w'.

Claim 30. (Cancelled).